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Class I, HEXAPODA.

Order I, HYMENOPTERA.

TRICHOGRAMMA PRETIOSA RILEY. MISCELLANEOUS HABITS OF THE ADULT, WITH A LIST OF HOSTS.

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The following is a conclusion of the publication of observations made on this egg-parasite during the Cotton Bollworm Investigations in Texas in 1904 by the National Bureau of Entomology. The more important of these have already been published, or presented for publication, and this brief paper records especially those details of its life-history which are of minor consideration or of interest solely from the biological standpoint. The observations were made at Paris, Texas, latitude $33^{\circ} 45'$, and the host was *Heliothis obsoleta* Fabricius, the common bollworm of cotton.

Emergence. — The little parasites issue from the host eggs as adults through one or several holes cut by their jaws generally in the upper side of the egg. The hole is usually rounded in outline, but with jagged edges. Quoting from a general note made in 1904: "Out of 36 cases of emergence, 32 were from single holes in various parts of the host egg; the remaining 4 were from 2 holes in the host. In the latter cases, in 2 hosts, there were 2 large, equal, round holes, side by side in the upper end; in the third, 2 unequal round holes, one on each and opposite sides of the host, and in the fourth case, exit was made through a small round hole at apex and a large jagged rent

in the side near base. As 83 parasites issued from these 36 hosts, it is evident that in the majority of cases more than 2 came from a single host, using a common exit-hole."

Additional records obtained for 45 hosts from which more than one parasite issued showed that but 5 or 11 per cent. made their exit through more than one hole; the remaining 89 per cent. emerged through single exit-holes. The hosts in this case averaged about three parasites apiece.

The position of the exit-hole varies. They may involve the micropyle of the host egg, or be near the base, but as stated are generally in the upper half of one side, or near the middle of the side. Their shape varies from small, almost perfectly round holes just the size of the parasite's body, to large, irregular, jagged ones, but is normally a mean between these two extremes. Exceptionally, an exit-hole may involve the whole of one side of the host egg. When the parasites issue from a single host through several holes, usually 2, they are as a rule smaller and round, and in the upper side of the egg. They may or may not adjoin, for instance may be on opposite sides of the host, or all grouped together at the micropyle but separated one from the other. Their method of issuing from the eggs of *Alabama argillacea* Hübner is about the same.

"*Brachypterous*" specimens. — Riley (1885) in writing of this species mentions what he probably supposed to be true brachypterous specimens, but which must have been very recently emerged ones, which have the wings folded in dark squares over the back. On June 30, I noted this to be the case with two males and five females issuing at 2 P. M., and in the autumn, many recently emerged specimens were found with the wings in that condition. Naturally at that time of the year they would be noticed more for the reason that it took a much longer time for them to spread. A single "short-winged" female was captured just as it issued from an egg of *Alabama argillacea* Hübner on a cotton leaf, at 11 A. M., October 23, 1904. The wings were unspread and folded so as to "resemble paddles" (Riley, 1885). It was taken to the laboratory and confined in a small glass vial, but up to 6 P. M. had not changed. However, on the following morning, it was found with normally spread wings. Two specimens issuing on the morning of November 1 had their wings similarly folded and which became normal by the following morning, and this was repeated in the case of numerous specimens emerging on the morning of November 4.

Habits. — Although the parasites occur in great numbers, on account of their minute size and inconspicuousness, they are rather difficult to find in nature. For this reason their natural habits in regard to activity are more or less unknown, except in the case of ovipositing females.

They have been observed crawling over the leaves of corn and cotton, mostly in the morning of fair and clear days, but have never been observed to feed on the secretions of leaf glands as do various of the Chalcidoidea. In the laboratory, however, they have been fed on ripe peach juice and a diluted water solution of brown sugar, sometimes feeding rather eagerly, but mostly quite incidentally, and in one case, not at all. The taking of food seems to have no effect on the length of life.

In regard to the latter, of course, we have nothing but laboratory records upon which to base conclusions. Through all of the breeding season of 1904 numerous specimens were kept under spacious glass jars, and their length of life noted. Summing up results, the average length of life was about 36 hours or slightly longer, but the range was from 12 to 108 hours. The longer period was very exceptional. The males die somewhat earlier than the females. The season of the year apparently has no effect on the length of life. Both sexes are very active and crawl rapidly and they also fly and are then very hard to see.

Percentage of Alabama eggs killed. — A few records, late in the season, were obtained for the percentage of the eggs of *Alabama argillacea* Hübner, the cotton caterpillar, killed by this parasite. On October 22, parasitized eggs were common on cotton but healthy eggs scarce. Forty-six (46) eggs collected from the leaves on that date showed by census 73.9 per cent. parasitism; by the end of the week following, the percentage for this lot was 76 per cent., another egg having since shown the characteristic blackened color.

The percentage of *obsoleta* eggs parasitized during 1904 has been given by Quaintance and Brues (1905).

List of hosts. — The genus *Trichogramma* confines its attacks mostly to the Lepidoptera, as far as our records go, but one species, *odontotæ* Howard, attacking the Coleoptera (*Odontota dorsalis* Thunberg), and one, *ceresara* Ashmead, known definitely to attack Hymenoptera (*Ceresa bubalus* Fabr.), and two species attacking the Hymenoptera, namely, *minuta* Riley and *pretiosa* Riley. The latter species is known to attack members of two orders, Hymenoptera and Lepidop-

tera, and has quite a large number of hosts belonging mostly to the last named order. It was first recorded from *Alabama* and *Heliothis* and the genus *Pteronus*, and at present has been reared from the following hosts. — Lepidoptera: *Alabama argillacea* Hübner, *Autographa brassicae* Riley, *Carpocapsa pomonella* Linn., *Heliothis obsoleta* Fabricius, *Ianassa lignicolor* Walker, *Laphygma frugiperda* Smith & Abbot, *Mamestra picta* Harris, *Phlegethontias sexta* Johanssen, *Platynota rostrana* Walker, *Polychrosis viteana* Clemens. — Hymenoptera: *Pteronus ribesii* Scopoli and doubtfully *Pachynematus palliventris* Cresson.

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1885. Riley, Charles Valentine. 4th Rep. U. S. Ent. Commission, Washington, p. 102.
1905. Quaintance, Altus Lacy and Charles Thomas Brues. Bull. No. 50, Bureau Ent., U. S. Dep. Agric., Washington, p. 116.

Class I, HEXAPODA.

Order IV, DIPTERA.

**A NEW GENUS AND SPECIES OF SABETHID
MOSQUITO.**

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Dinomimetes, new genus.

Eyes contiguous; clypeus without bristles; antennæ very long, filiform, ciliate, the whorls inconspicuous, the second segment over fourteen times as long as wide in both sexes; metanotum with setæ. Prothoracic lobes well separated.

Dinomimetes epitedeus, new species.

Female: Antennæ, the tori small, globular, ochreous, naked; second segment extremely long; third segment about two-thirds as long, the following ones successively shorter; the segments are densely ciliate and bear many scattered longer setæ; the second segment brown scaled. Clypeus elongate, conical, naked. Labial palpi moderately short. Occiput clothed with narrow pale brownish recumbent scales and a few scattered erect forked ones; along the posterior margin a dense conused row of erect forked scales. Prothoracic lobes prominent. Mesonotum brown, the scale vestiture bronzy brown, having two submedian bare stripes and with numerous coarse setæ, mostly in subdorsal and lateral rows, longest and most closely placed on the posterior portion. Scutellum distinctly trilobed, yellow-brown, with three patches of brown scales and groups of long coarse setæ on the lobes. Meta-